DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 69.28

WELDING INSPECTION REPORT

Resident Engineer: Pursell, Gary
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-004768
Date Inspected: 08-Nov-2008

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

OSM Arrival Time: 1330
OSM Departure Time: 600
Location: Shanghai, China

CWI Name: Mr. Chen Xi

Inspected CWI report:	☐ Yes	☑ No	☐ N/A	**Rod Oven in Use:**	☐ Yes	☐ No	☑ N/A
Electrode to specification:	☑ Yes	☐ No	☐ N/A	**Weld Procedures Followed:**	☑ Yes	☐ No	☐ N/A
Qualified Welders:	☑ Yes	☐ No	☐ N/A	**Verified Joint Fit-up:**	☑ Yes	☐ No	☐ N/A
Approved Drawings:	☑ Yes	☐ No	☐ N/A	**Approved WPS:**	☑ Yes	☐ No	☐ N/A
				Delayed / Cancelled:	☐ Yes	☑ No	☐ N/A

CWI Present: ☑ Yes ☐ No

Bridge No: 34-0006
Component: OBG Fabrication

Summary of Items Observed:

Caltrans Quality Assurance (QA) Inspector, Mr. Paul Dawson, arrived on site at the Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China, for the purpose of monitoring welding and fabrication of the San Francisco / Oakland Bay Bridge (SFOBB) components. The QA Inspector observed the following:

89M Mock-up

At around 1730 hours the Caltrans QA Inspector observed ZPMC QC documentation that indicates ZPMC completed the welding of MUB-MA21-A/J-33 and MUB-MA21-A/J-69 at around 1300 hours. ABF representative Mr. Li Nan informed the QA Inspector that he and ZPMC QC Mr. Lin Yong are monitoring the cool down temperature of these two weld joints. The QA Inspector monitored this activity and at 1730 hours the QA Inspector observed the laser temperature indicating device that is being utilized to monitor the weld temperature indicates a temperature of approximately 79°C (Celsius) and QC has been recorded the temperatures every thirty minutes. The following temperature measurements have been recorded:

Time: Temp: Drop in temperature:
1300: 203°C NA (Welding completed, Start of Cooldown)
1330: 198°C 5°C decrease in 30 minutes
1400: 186°C 12°C decrease in 30 minutes, 17°C decrease in the last hour
1430: 178°C 8°C decrease in 30 minutes, 20°C decrease in the last hour
1500: 160°C 18°C decrease in 30 minutes, 26°C decrease in the last hour
1530 : 143°C 17°C decrease in 30 minutes, 35°C decrease in the last hour

1600: 125°C 18°C decrease in 30 minutes, 35°C decrease in the last hour
1630: 110°C 15°C decrease in 30 minutes, 33°C decrease in the last hour
1700: 92°C 18°C decrease in 30 minutes, 33°C decrease in the last hour
1730: 78°C 14°C decrease in 30 minutes, 32°C decrease in the last hour
1800: 60°C 18°C decrease in 30 minutes, 32°C decrease in the last hour
1830: 42°C 18°C decrease in 30 minutes, 36°C decrease in the last hour
1900: 30°C 12°C decrease in 30 minutes, 30°C decrease in the last hour
1930: 19°C 11°C decrease in 30 minutes, 23°C decrease in the last hour

Submittal SUB101R2 allows a maximum heat drop of 40°C per hour and the cooling rate of these two welds appears to comply with the submittal.

Heavy Bay 3

The QA Inspector performed initial random visual inspections of closed rib stiffener welds of deck panels DP303-001, DP306-001 and DP297-001 The QA Inspector observed ZPMC and ABF representatives had completed visual inspections of these welds and they had identified portions of the welds that need rework. The initial inspections have been documented on the bottom of the yellow inspection status tag that is attached to each of the deck panels. The QA Inspector completed the initial visual inspections of the welds on all three of these deck panels and marked a few additional areas where weld overlap existed. The QA Inspector documented the initial visual inspections on the bottom of the yellow inspection status tags that are attached to each of the deck panels.

The QA Inspector performed random magnetic particle inspections of closed rib stiffener welds of deck panels DP085-001, DP112-001 and DP490-001. The QA Inspector observed ZPMC had completed magnetic particle inspections of these welds and they had indicated the welds are MT acceptable and they indicated this acceptance on the yellow inspection status tag that is attached to each of the deck panels. The QA Inspector documented the magnetic particle inspections on the yellow inspection status tags that are attached to each of the deck panels. See the TL6028 Magnetic Particle Test Report for additional information.

OBG Bay #7

The QA Inspector performed random AWS D1.5 visual and magnetic particle inspections of the following OBG component welds in support of the yellow tagging as listed on the ZPMC Notification of Witness Inspection document #1377:

FB003-066: QA performed random magnetic particle inspection of welds 2, 4, 59, 60, 67, 68, 75, 76, 91, 92, 99 and 100. The welds appear to comply with project specifications. The ZPMC Notification of Witness Inspection document #1377 states this floor beam is being presented for “Tagging In Process” and the QA Inspector observed that welds 11, 12, 23, 27, 35, 36, 47 and 48 have been tack welded in place and these welds were not completed. The QA Inspector did not write ion the yellow tag due to these welds have not been completed.

FB003-067: QA performed random magnetic particle inspection of welds 2, 4, 59, 60, 67, 68, 91, 92, 95, 96, 99 and 100. The welds appear to comply with project specifications. The ZPMC Notification of Witness Inspection

document #1377 states this floor beam is being presented for "Tagging In Process" and the QA Inspector observed that welds 11, 12, 23, 27, 35, 36, 47 and 48 have been tack welded in place and these welds have not been completed. The QA Inspector did not write a lot number on the yellow tag due to these welds not being completed.

FB003-084: QA performed random magnetic particle inspection of welds 1, 2, 4, 59, 60, 67, 68, 83 and 84. The welds appear to comply with project specifications. The ZPMC Notification of Witness Inspection document #1377 states this floor beam is being presented for "Tagging In Process" and the QA Inspector observed that welds 11, 12, 23, 27, 35, 36, 47 and 48 have been tack welded in place and these welds have not been completed. The QA Inspector did not write a lot number on the yellow tag due to these welds not being completed.

FB003-059: QA performed random magnetic particle inspection of welds 1, 2, 4, 83, 84, 91, 92, 99 and 100. The welds appear to comply with project specifications. The ZPMC Notification of Witness Inspection document #1377 states this floor beam is being presented for "Tagging In Process" and the QA Inspector observed that welds 11, 12, 23, 27, 35, 36, 47 and 48 have been tack welded in place and these welds have not been completed. The QA Inspector did not write a lot number on the yellow tag due to these welds not being completed. See the photograph below showing several of the welds that have not been completely welded.

OBG Bay 1

The QA Inspector monitored welding of closed rib Production Monitoring Test (PMT) representing deck plates DP421-001 and DP394-001 which were welded at approximately 0100 hours on November 9, 2008 using gantry #1. The QA Inspector observed six ZPMC welders using welding procedure specification WPS-B-T-2342-U1(Urib)-4 using the gas metal arc welding process for the root pass and submerged arc welding process for the cover pass of partial penetration groove welds on six PMT closed rib welds at the same time. ZPMC has multiple flux cored welding manipulators attached to a movable gantry that runs on a track along the length of the stiffener plates. The QA Inspector observed a welding travel speed of approximately 528mm per hour for the root passes and 514 mm for the cover passes. As the welding commences, each of the welders is responsible for one of the welding heads. Welder Ms. Zhang Li Ping, stencil 218040 completed the root pass of weld #1 with a welding current of approximately 380 amps and 31.6 volts and the cover pass welding current of approximately 685 amps and 24.5 volts. Welder Mr. Zhao Cheng Shuang, stencil 59400 completed the root pass of weld #2 with a welding current of approximately 375 amps and 30.8 volts and the cover pass welding current of approximately 680 amps and 25.6 volts. Welder Mr. Xhang Shao Hui 59403 completed the root pass of weld #3 with a welding current of approximately 360 amps and 30.4 volts and the cover pass welding current of approximately 680 amps and 25.1 volts. Welder Mr. Tiang Shuang Chen, stencil 201788 completed the root pass of weld #4 with a welding current of approximately 360 amps and 30.5 volts and the cover pass welding current of approximately 680 amps and 25.0 volts. Welder Ms. Wang Xiao Rong, stencil 59445 completed the root pass of weld #5 with a welding current of approximately 355 amps and 30.2 volts and the cover pass welding current of approximately 680 amps and 24.7 volts. Welder Mr. Song Yun Shu, stencil 59421 completed the root pass of weld #6 with a welding current of approximately 355 amps and 30.2 volts and the cover pass welding current of approximately 690 amps and 25.0 volts.

The QA Inspector performed random visual inspection of the root pass and cover passes and items observed appear to comply with project specifications. Following completion of the welding ZPMC QC CWI Inspector Mr.

Chen Xi marked a 500 mm length of the welds as being the areas that are to be representative of this PMT test. The QA Inspector observed ZPMC NDE inspector performing ultrasonic of each of the six welds in the areas where Mr. Xi had marked for PMT testing. Following Mr. Qin's UT acceptance the QA Inspector marked a total of 15 locations where macroetch samples are to be obtained. ZPMC then cut and prepared macroetch samples. ZPMC QC CWI Inspector Mr. Chen Xi and ABF representative Mr. Wang Zhen Hua visually inspected these macroetch samples and documented their acceptance on the ZPMC "Production Monitoring Test Plate Inspection Report sheet dated 11-09-08. The QA Inspector visually inspected each of these macroetch samples and items observed by the QA Inspector appear to comply with project specifications.

Summary of Conversations:

See above.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Ady Velasco 13816942685, who represents the Office of Structural Materials for your project.

Inspected By:	Dawson,Paul	Quality Assurance Inspector
Reviewed By:	Carreon,Albert	QA Reviewer